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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,372	08/10/2001	Jun Nakagawa	110106	2666

25944 7590 05/05/2004

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EXAMINER

PAPPAS, PETER

ART UNIT	PAPER NUMBER
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2671

7

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/889,372

Applicant(s)

NAKAGAWA, JUN

Examiner

Peter-Anthony Pappas

Art Unit

2671

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 9, 11-14 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foley et al. (Computer Graphics: Principles and Practice), in combination with Deering (Pub. No. US 2003/0011618 A1).
3. In regards to claim 1 Foley et al. teaches a high-level conceptual framework which can be used to describe almost any interactive graphics system (page 17, §1.6.1; Fig. 1.5). Foley et al. teaches depth cueing, seen as a simplified version of the effects of atmospheric attenuation, exploits the fact that distant objects (objects intended to appear farther from the viewer) appear dimmer than closer object. In depth cueing interpolation occurs between the color of a given primitive (color of a given object, as represented by its primitive) and a user-specified depth-cue (target) color (pages 610-611, §14.3.4; pages 727-728, §16.1.3; pages 1044-1046, §20.8.2).

Foley et al. fails to explicitly teach varying an alpha value of the object so that the object being more distant from the viewpoint becomes more transparent. Deering teaches that simple fogging is a special case of alpha blending, in which the degree of alpha changes with distance (depth) so that the object appears to vanish into a haze

(alpha varies), as the object moves away from the viewer. This simple fogging may also be referred to as depth cueing or atmospheric attenuation (page 1, ¶ 11).

It would have been obvious to one skilled in the art, at the time of the applicant's invention, to combine the teachings of Foley et al. and Deering, in regards to the details of depth cueing and atmospheric attenuation (i.e. haze), because Deering further defines how atmospheric attenuation can be achieved, in regards to varying an alpha value, and therefore serves to further clarify an application of said atmosphere attenuation when used in various graphic systems.

Foley et al. teaches a viewing means by which rendered (drawn) objects are viewed dependent on a given perspective projection, wherein the presented view of said objects change in accordance with the change of said perspective projection. The visual effect of said perspective projection is similar to that of photographic (camera) systems (pages 230-236, § 6.1). Foley et al. also teaches a synthetic camera (pages 299-302, § 7.3.4).

4. In regards to claim 2 the rational disclosed in the rejection of claim 1 is incorporated herein. it is noted that said interpolation between said primitive color and said user-specified depth-cue color is considered to yield a spectrum of colors, wherein said colors are a combination of said primitive color and said user-specified depth-cue color.

5. In regards to claim 3 Foley et al. teaches the use of bounding boxes (both 2-D and 3-D) for the bounding an object or objects, within a given area, wherein any

processing (i.e. clipping) on said object or objects is limited to the bounds of said bounding boxes (page 67, ¶ 1; page 68, Fig. 3.1; pages 660-663, § 15.2.3).

6. In regard to claim 4 the rationale disclosed in the rejection of claim 3 is incorporated herein.

7. In regards to claim 9 the rationale disclosed in the rejection fo claim 1 is incorporated herein.

8. In regards to claim 11 the rationale disclosed in the rejection of claim 1 is incorporated herein. Foley et al. teaches that the graphics system is thus an intermediary between the application program and the display hardware (pages 17-19, § 1.6.1-1.6.2).

9. In regards to claim 12 the rationale disclosed in the rejection fo claim 2 is incorporated herein.

10. In regards to claim 13 the rationale disclosed in the rejection fo claim 3 is incorporated herein.

11. In regards to claim 14 the rationale disclosed in the rejection fo claim 4 is incorporated herein.

12. Claims 5-6 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foley et al. (Computer Graphics: Principles and Practice) in combination with Deering (Pub. No. US 2003/0011618 A1), as applied to claims 1-4, 9, 11-14 and 19, in further view of Berry (U.S. Pat. No. 5, 704, 025).

13. In regards to claim 5 Foley et al. and Deering fail to explicitly teach processing a depth cueing value, for each vertex of the object, based on a Z-value for each vertex of

the object and processing an alpha value, for each vertex of the object, based on the Z-value for each vertex of the object. Berry teaches for each vertex, the vertex parameters may include X, Y and Z coordinates, normal coordinates, color values (R, G, B and α) and texture mapping values (column 6, lines 24-27). A depth cue scale factor is set dependent on a given vertex's Z values (column 7, lines 11-15).

It would have been obvious to one skilled in the art, at the time of the applicant's invention, to store relevant data required for depth cueing and alpha processing in the vertices of a given object, as taught by Berry, because by initially storing said information on a vertex basis rather than on a per-pixel basis allows per-pixel data to be interpolated from respective bounding vertices, thus reducing the amount of memory space required to store such data if initially stored on a per-pixel basis.

In further regards to processing said alpha value the rationale disclosed in the rejection to claim 1 is incorporated herein.

14. In regards to claim 6 the rationale disclosed in the rejection of claim 5 is incorporated herein.

15. In regards to claim 15 the rationale disclosed in the rejection of claim 5 is incorporated herein.

16. In regards to claim 16 the rationale disclosed in the rejection of claim 6 is incorporated herein.

17. Claims 7-8, 10, 17-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foley et al. (Computer Graphics: Principles and Practice) in

combination with Deering (Pub. No. US 2003/0011618 A1), as applied to claims 1-4, 9, 11-14 and 19, in further view of Baldwin (U.S. Pat. No. 5, 764, 228).

18. In regards to claim 7 Baldwin teaches when using GLINT to render anti-aliased polygons, depth buffering cannot be used. Polygons should therefore be depth sorted, and rendered (drawn) front to back, using the alpha blend modes. In this way the alpha component of a fragment represents the percentage pixel coverage, and the blend function accumulates coverage until the value in the alpha buffer equals one, at which point no further contributions can be made to a pixel (column 49, lines 13-24). It is noted said polygons are considered part of a given object.

It would have been obvious to one skilled in the art, at the time of the applicant's invention, to incorporate anti-aliasing, as taught by Baldwin, into the system taught by Foley et al. and Deering, because through the application of anti-aliasing to a graphics system the visual quality would benefit from improvement and in addition, as taught by Baldwin, through the use of front to back rendering, rendering elements occluded by a given opaque element, in front of said occluded elements, would be able to be avoided (as they are now known to be occluded), thus saving additional processing time.

19. In regards to claim 8 the rationale disclosed in the rejection of claim 7 is incorporated herein.

20. In regards to claim 10 the rationale disclosed in the rejection of claim 7 is incorporated herein.

21. In regards to claim 17 the rationale disclosed in the rejection of claim 7 is incorporated herein.

22. In regards to claim 18 the rationale disclosed in the rejection of claim 8 is incorporated herein.

23. In regards to claim 20 the rationale disclosed in the rejection of claim 11 is incorporated herein.

Conclusion

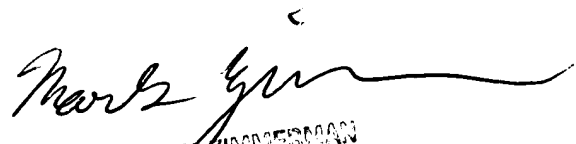
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter-Anthony Pappas whose telephone number is 703-305-8984. The examiner can normally be reached on M-F 9:30am-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman can be reached on 703-305-9798. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Peter-Anthony Pappas
Examiner
Art Unit 2671

PAP


MARK ZIMMERMAN
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